ENTOMOLOGICAL NEWS

AND

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CONTENTS:

Hulst—Elementary Entomology	65	Fox—Studies among the Fossorial Hymenoptera	86
Editorial	72	Holland—Some new and little-known African Hesperiidæ	89
Economic Entomology	73	Mengel—Description of new species of Myscelia from western Mexico	96
Notes and News	77		
Entomological Literature	81		
Entomological Section	85		

ELEMENTARY ENTOMOLOGY.

LEPIDOPTERA–HETEROCERA (Moths).

By GEO. D. HULST, Ph.D.

The Geometrina comprise about 600 described species, and there remain probably from 200 to 300 species to be described.

They are, as a rule, slender-bodied moths, with large, frail wings, and a weak flight. The labial palpi are usually rather short, not more than half the length of the head, projecting forward, with the end member usually very short; sometimes as long as the head, very rarely recurved. In two instances only in the males they extend far forward, with second member very long, the palpi being decidedly Deltoid in appearance.

The maxillary palpi are wanting. I have, by careful bleaching under a strong power, found rudiments, but these are scarcely to be noticed here.

The antennæ are very variable. In the females they are more simple in character than in the males, being generally ciliate and rarely bipectinate. In the males they vary from the simplest form through serrate and dentate to very broadly plumose bipectinate. With us no form has been found with unipectinate antennæ as in other parts of the world, and one only with antennæ doubly bipectinate.

The tongue is generally well developed, long though slender. In a few cases it is wanting.

The ocelli are generally wanting, and are never prominent.

The eyes are very uniform in character, being generally large, globose, prominent and naked.

The clypeus is variable in appearance, generally broad and subquadrate. It is sometimes broader than long, and rarely very narrow, with the eyes almost joined. It varies generally from being flat to being well rounded, and is rarely tubercled. The vestiture is generally scaly and close, but very often the front is tufted, and rarely with hairs.

The head, as a whole, is generally large, prominent and free, though in the Bombycoid forms there is a strong tendency to retraction and smallness, as well as to a loss of the tongue, and an increase in hairness and quantity of vestiture.

The thorax is generally slender and weak. The vestiture is generally loose. There is rarely a dorsal crest, more often low posterior tufts. The patagiæ are well developed, loose, fluffy.

The wings are generally very large for the size of the body, though frail. They are always present in the males, but in a few cases are aborted or entirely wanting in the females. Ordinarily, where present the wings have sharper apices and angles in the females than in the males. The wings vary in shape from very broad almost to lanceolate; apices and angles are broadly rounded, or extended and acute; margins even, angulated, incised or eroded. They are generally covered with short scales, closely laid, as a rule; but these are often in part, sometimes altogether, transformed into close-lying hairs. In a few cases the wings of the males are ornamented with tuftings or pencils of hairs.

The venation is extremely variable; far more so, probably, than any other family of the Lepidoptera; both as the species are compared, and in the individuals of the species. The fore wings are generally 12-veined, though in individual specimens 13 are found, the last being along the costa nearer the base than 12. Vein 11 is very often wanting, so that many species have 11 veins only, though this cannot be depended upon to any great extent for classification, as in any specimen of the species vein 11 is likely to appear. There are one or two internal veins. Vein 5 is generally from near the middle of the outer edge of the cell.

Veins 7, 8 and 9 nearly always on one stem. In very many species, more generally in the 11-veined ones, there is a vitreous spot or fovea, as Mr. Meyrick calls it, at the base of 1a in the fore wings beneath. In a few cases a pencil of hairs near the same spot. In one of our species there are 8 veins only in the fore wings, and in very many the relations of 10, 11 and 12 are extremely variable, these separating or anastomosing in the individual species without regard to uniformity. In some cases there is no accessory cell, in many there is one, in many two. In some cases there is a subcostal cell, but 12 is generally free.

The hind wings have normally 8 veins. There are one or two internal veins, and the position of all veins presents great variation. Veins 3 and 4 generally separate, are sometimes stemmed. Vein 5, generally near the centre of the outer margin of the cell, is very often wanting, or merely a fold. Veins 6 and 7 may be separate or stemmed; vein 8 may be stemmed with the anterior part of the cell, joined near its base only, joined by a short cross-bar, or entirely separate. The wing often has a vitreous spot or fold below at base near vein 8, and the inner edge is quite often modified by a fold and hair tuftings.

The abdomen is slender, rather long, sometimes with lateral or dorsal tufts in the male.

The legs present very considerable variation. They are generally long, slender and frail, in some cases very long. The fore tibiæ are rarely spined. The epiphysis is always present, and is often prolonged to beyond the end of the tibiæ.

The middle legs are, with one exception, armed with a pair of spurs at the end of the tibiæ, and are very uniform.

The hind legs are generally longer than the others, and are usually with a pair of spurs at the end, and another pair above near the middle of tibia. In a few cases the legs are so much aborted as to be useless, and in a few are simply rudimentary in character. Many are furnished with a long pencil of hairs; this starts from the upper portion of the tibia and reaches to the lower end, being ordinarily concealed in a long groove on the inner side; where the hair pencil exists there is always a swelling and enlargement of the tibia, and a shortening and abortion of the spurs and tarsi. This is a characteristic of the males, though in some cases there is a loss of spurs in the female. The history of variation in the hind legs seems to be as follows: The legs are

normally long and slender, with two pairs of spurs. Then for ornamentation the tufting is evolved, with the tibia correspondingly developed at the expense of the spurs and tarsi. Soon the eg becomes an appendage for ornamentation only, not for walking. But, not being used for walking, its muscular power fails, without a recovery of its normal power, the other legs being sufficient for that purpose. With the loss of muscular energy the tufting vanishes, the tibia contracts and weakens, and the whole leg becomes more and more rudimentary.

The moths have a weak uncertain flight, rarely prolonged. They are, as a rule, easily disturbed by day. They hide during the hours of light underneath leaves and rubbish, or against the bark of trees, which in coloration they much resemble. In repose the wings lie flat, but generally partly spread. They are most abundantly found among plants in rich dark woods, and in damp swampy valleys.

The eggs are generally oval, slightly flattened, and covered with reticulated spaces.

The larva are largely characteristic from their peculiar mode of progression. One or more pairs of the abdominal legs are wanting, and to move the hind part of the body is drawn forward, curving up the central portion. They are consequently called "loopers" or "measuring worms." In a few species the first, or first two pairs of abdominal legs are wanting; in the great majority the first three pairs are aborted. The two hind pairs are correspondingly developed and muscular.

The larva is generally naked, slender, cylindrical, rarely with extended processes, but generally more or less roughened, mimicing in appearance living or dead twigs, or the petioles of leaves. They are generally nocturnal in habit, during the day descending to the ground or sitting rigid upon their hind legs with the body raised and extended in a nearly straight line. They spin a thread of silk as they move along, and when disturbed are apt to drop by this to the ground. They are as a consequence easily collected by beating bushes and plants over an umbrella.

The larvæ are often of economic importance, a few, such as the canker worms, becoming pests in certain parts of the country.

The pupa is generally slender, naked, and elongated; sometimes suspended by the extremity of the abdomen, and with a girth of silk about the thorax, sometimes in a thin cocoon, and sometimes it is subterranean.

The Geometrina are, in the main, very easily separated from other families of the Lepidoptera, but in some cases they very nearly approach certain Bombycina and Noctuina. From the latter they can be distinguished by the position of vein 5 of the fore wings, which in the Noctuina is close to 4, at the lower angle of the cell, while in the Geometrina it is near the middle of the outer edge of the cell.

From the Bombycina they are separated by a phase of structure which is at once characteristic and exclusive—namely, the structure of the larva. The tendency of the Bombycina is towards the modification of the *posterior* abdominal legs to other uses, often resulting in their entire abortion. In the Geometrina the tendency is to give them more power by an abortion of the *anterior* abdominal legs. I am aware that entomologists look with little favor upon taking anything but the mature insect in classification, but embryology will change that. In botany, and elsewhere in zoology, embryological characters are regarded as being of the greatest importance, and certainly a student can locate his insect as closely by the eyesight only from the larvæ as he can from the imagines. The species is the insect in both sexes, and in its whole history.

The classification of the Geometrina has been largely artificial and empirical. The systematists have seemingly arranged their collections as nearly as it seemed they ought to be from appearance, and made their genera conform to peculiarities of appearance or the more obvious breaks in the line. There was no ability, and rarely any effort to exclusive definition. Some have, through Hübner, Curtis, Stephens, Treitschke, Duponchel and Guenée, a classification without structural definition, and this has culminated with the system of von Gumpenberg, who follows the law that "nothing shall be used in classification which requires the use of the glass, or the denuding in any way of the insect." The early systematists of course are to be pardoned, as they were pioneers groping their way to the light.

A structural classification was begun by Herrich-Schaeffer, and vastly bettered by Lederer, whose system has been followed in Europe from his time till now. Both, however, had in their systems much that was not based on structure.

In 1892, Mr. Edward Meyrick, of England, published a paper on the "Classification of the Geometrina of the European

Fauna," in which he gave a classification rigidly based on structure, while following as far as possible the line of superficial resemblances. He also follows the now universally-received law of priority in the use of generic names. We have thus a classification which is thoroughly structural, and promises to be more or less permanent. And we have generic names which cannot be superseded, thus giving a permanent nomenclature.

As applied to our own fauna, adding where it does not apply, as well as changing in some items of importance, Mr. Meyrick's classification is as follows, by synopsis, so far as families go:

GEOMETRINA.

1. Hind wings.—Vein 5 present and strong . . . . . 2.
   Hind wings.—Vein wanting, or a fold only . . . . . **Ennomidæ.**
2. Hind wings.—Vein 8 anastomosing with cell more than one-half its length; or when separate, joined by a cross-bar beyond the middle of the cell . . . . . **Hydriomeniidæ.**
   Hind wings.—Vein 8 entirely separate from cell, or joined only shortly at base . . . . . 3.
3. Fore wings.—Veins 6 and 7 stemmed, separate from 8 and 9. **Microniidæ.**
   Fore wings.—Vein 7 long stemmed with 8 and 9 . . . . . 4.
4. Hind wings.—Vein 5 much nearer 6 than 4. . . . . **Geometridæ.**
   Hind wings.—Vein 5 near middle of cell . . . . . 5.
5. Hind wings.—Vein 8 separate from cell at base, then shortly anastomosing, then rapidly diverging . . . . . **Sterrhidæ.**
   Hind wings.—Vein 8 entirely separate from cell, or shortly joined at base, then subparallel with cell . . . . . **Monoctænidæ.**

The Ennomidæ cover many divergent forms. *Ripula* has doubly bipectinated antennæ. Many species have 11 veins only in the fore wings, and many have the basal fovea beneath in the male. These correspond to what has been known as the Boarminæ. The greatest aberrancy is shown in wing form among the Ennomidæ, as the species have the borders very variable through angulation.

The Hydriomeniidæ cover what has been known as *Eupithecia* and the Cidaridæ. Some of the species have the inner margin of the hind wings modified by a lobe or tufting, as *Calocalpe*. Those where vein 8 is joined with the cell in the hind wings also have the inner edge of these wings much modified in some cases, and are known as the Lobophorinæ. *Dyspteris* falls in this group.

The Microniidæ include only a few genera with us. They are far more largely represented in the tropics. *Leucula*, *Calledapteryx* and *Callizzia* belong here.

The Geometridæ include most of the green moths. They vary much in the sexes so far as the palpi and post-tibial spurs go.

The Sterrhidæ take the place of the Acidaliinæ. They are very closely connected with the Geometridæ, and here the greatest variation in the structure of the hind legs is found. *Goniacidalia* has but 8 veins in the fore wings.

The Monoctænidæ (another new name to us) are poorly represented in our fauna, though a very large family in Australia and the far East. They connect the Hydriomeniidæ with the Geometridæ, and are represented by the genera *Brephos*, *Baptria*, *Paleacrita*, and a few others.

A full classification of the Geometrina following Mr. Meyrick's method is now in preparation, and will shortly be published.

THE statement in the "Canadian Entomologist" vol. xxv, p. 310, of Rev. W. J. Holland that a specimen of *Erebus odora* was found in the lecture-room of a church in Allegheny, Pa., reminds me of a similar experience:

When I was Superintendent of Schools at Racine, Wis., in 1879, the janitor of the High School building, an excitable old gentleman, rushed up to me one morning with the information that after considerable effort (which no doubt he considered praiseworthy) he had captured a bat in one of the school-rooms and had confined it within one of the drawers of my desk. An entomologist will imagine my feelings when, on investigation, I found a specimen of *Erebus odora* battered almost beyond recognition, especially when at that time the species was a stranger to my cabinet. It goes without saying that the janitor was instructed to allow me to capture any other bat that he might discover on the premises. Only forty-eight hours afterwards he came to me with the information that there was another bat in a certain room. By lashing my entomologist's cane to a ten-foot pole I had little difficulty in capturing the "bat," though it had chosen a position on the ceiling, fortunately beyond the janitor's reach. It was a magnificent specimen of *Erebus odora*, perfectly fresh.

My curiosity is excited anew as to the motive which impels this moth in particular to enter houses. It seems to be something more than an accident. In this case it could not have been the attraction of artificial light, for the school-room was never lighted at night. It is also true, so far as I have observed, that *Erebus odora*, though coming to trees smeared with treacle for the capture of moths, will invariably start if the light of a dark lantern is allowed to come near it.—O. S. WESTCOTT, Chicago, Ill.

ENTOMOLOGICAL NEWS.

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PHILADELPHIA, PA., MARCH, 1894.

BORROWING BOOKS.

A correspondent writes as follows: "Is there any possible way of borrowing books from the Philadelphia Academy of Natural Sciences or the American Entomological Society? If not, might not some scheme be devised? For example, I particularly want to see Ragonot's new monograph Phycitidæ and several parts of the "Biologia Centrali-Americana." I don't care to buy them; and, in fact, do not want to possess them at all, but if I could borrow such works by paying all cost of transport and depositing a sum to cover possible loss, it would be a great advantage. You see entomology is being dreadfully crippled by the great difficulty of getting necessary works, the result being that those not situated near a large library are placed at a disheartening disadvantage. Cannot this matter be brought up before the American Entomological Society or the Academy of Natural Sciences, and see if anything can be done? Many people would doubtless give books to form the nucleus of such a loan library, and probably enough money could be raised to pay the salary of a librarian. I think the mere discussion of the matter might have ultimate good results, though nothing was done at present." We see no reason why such a library could not be inaugurated with this idea in view. Of course, such a thing could not be done in any of our society libraries at present, as it would be a manifest injustice to those who pay for the use of the books, and if they found a work missing which they wished to consult, there would be war at once. Also, there are few libraries which have sufficient funds to duplicate expensive books, and expensive works are the ones which would be in demand. It would have to be a special library for this purpose alone, with a special fund and librarian. Of course, it could be an adjunct department to some already existing library.

DEPARTMENT OF ECONOMIC ENTOMOLOGY.

Edited by Prof. JOHN B. SMITH, Sc. D., New Brunswick, N. J.

Woodpecker Work.—It is nothing unusual to see a woodpecker hard at work on the trunk of a tree, evidently after a meal, and sometimes quite large trunks are hammered into in the search for larvæ. It is surprising how

FIG. 1.—Section of a trunk of black oak, showing holes made by woodpecker; one-third natural size (from a photograph).

much work seems to be done for such an apparently small return, and in wood like white and black oak. Among our rare insects are the *Cossids*, and among those forms that entomologists like to get, is *C. querciperda*.

I have recently received evidence that leads me to believe that the abundance of woodpeckers and the rarity of the *Cossids* are directly related. Through my friend, Mr. J. T. Brakeley, of Bordentown, N. J., who spends a considerable portion of the year in the New Jersey pines, I have recently received some good specimens of the work of woodpeckers in oak, and a figure* of one of the specimens is herewith presented showing the holes

FIG. 2.—Section of trunk sawed to show the burrows of the larva sought by the woodpeckers; the termination of their holes marked by a x; one-third natural size (from a photograph).

made by the woodpeckers on the outside of the tree, and showing also a cut through the trunk to indicate the locality of the larvæ that the woodpeckers were after. I urged upon Mr. Brakeley in his chopping operations to keep a lookout for the insects that the woodpeckers were after,

* These figures were first published in "Garden and Forest," No. 300, and electrotypes were obtained through the kindness of the publishers of that paper.

as he informed me that quite frequently he found that the woodpeckers had not reached the larval burrows, having been either scared off, or had become tired of the work, with all the probabilities in favor of the first suggestion. A few days ago he sent me a larva taken from one of these black oak sticks, and in this case also, a woodpecker had attempted to get at the burrow; but had for some reason stopped short, giving this larva a chance to mature. I had expected to find some Longicorn larva, and was quite surprised to find instead a magnificent specimen of a *Cossid*, which is almost certainly *querciperda*. These insects live for two or three years in the trees, and the woodpeckers, therefore, have a very long time to find them, and in that way few of them ever reach maturity and change to moths. When these insects inhabit the lower parts of trees and become nearly full grown, they make enormous channels, and these channels are very frequently taken possession of by ants, who make use of them for their nests. It is, indeed, quite usual to attribute this work to the ants. It would seem as if the nutritive value of these larvæ must be very high if it pays for the expenditure of force used in getting at them.

A New Fact in the Life-history of the Silk-worm.—One learns from all sorts of sources; even the daily papers sometimes give us extremely interesting information concerning entomology. The latest that I have seen is from the *New York Tribune* for Jan. 31, 1894, and it gives us the new information that "worms crawl out of their cocoons." The entire article is as follows:

"In the cargo of a steamer which recently arrived at a Pacific port from China were a number of boxes of silk-worms, in transit for London. After the steamer arrived in port the worms began to crawl out of their cocoons. Holes had been bored in the boxes to give air to the worms. They soon found the holes, crawled through them, and a number succeeded in reaching the deck, where they were picked up by visitors. An enterprising man on shore saw the worms, bought all he could get, and proposes starting a silk industry in Oregon."

We wish the enterprising man the enormous success he merits.

A Note on the Habits of the Cockroach.—It sometimes happens, even in the best regulated families, that certain household pests make their appearance in rather annoying numbers, and these are not always insect pests alone. Recently it has happened that in the house occupied by me there was an invasion of mice and roaches (*Periplaneta orientalis*) and some measures became necessary in order to get rid of them. A mixture of even parts of borax and chocolate, finely powdered and thoroughly mixed, proved tolerably effective, and it would probably have been perfectly satisfactory could I have had it applied thoroughly and persistently for a sufficient length of time. They did not disappear soon enough or completely enough to suit me, and I substituted a phosphoric paste, which was promptly effective in so far that the roaches disappeared from the lower regions where this had been used; but made their appearance in the upper part of the house, where they were even less welcome. For

the mice, traps were introduced, and a great haul was made two or three days in succession. I noticed one morning on examining the traps that one of the dead mice had been eaten into and a considerable portion of it devoured. I attributed this to cannibalism, and thought it probable that the mice were hard up for food. This occurred on two or three occasions, and in one instance I noticed that several roaches ran away from the trap when I opened the closet door. This induced me to look a little more carefully into the matter of the eating, and I suspected that the mice could not well have done that kind of chewing which was present. I concluded to experiment a little further, and when I captured another mouse, left it in the trap for two or three days to see what the outcome would be. Then early one morning I carefully opened the closet door scaring off several roaches that were evidently engaged in making a meal on the dead mouse. I found that they had not only eaten hide and hair, but had eaten a considerable portion of the intestines and the flesh. Around several of the vertebræ the muscular tissue had been cleaned off as completely as if ants had done it, and every bone and every process, and every spicule, as well as the ribs were perfect and entirely cleaned, making, so far as it went, a perfect skeleton. I had known, of course, that roaches were almost omnivorous, and that nothing was sacred to them; but this is the first time that I ever noted such a habit as that above described, nor do I recollect ever having read of any similar occurrence. Perhaps some of the readers of the NEWS have seen or heard of some like instance, and if so I would be pleased to have a note of it.

The Pear-leaf Blister-mite.—In Bulletin No. 61, of the Cornell Station, Mr. M. V. Slingerland has an account of the above insect, *Phytoptus pyri* Scheut., in which he finds that Winter spraying with the kerosene emulsion diluted not more than eight times is an almost perfect remedy. The life-history of the mite is stated, and it is found that the adults hibernate under the bud-scales, where they are easily reached by the kerosene, which penetrates every crevice readily. The emulsion diluted only three times produced no injurious effects upon the trees.

This result is an important one, in that it forces the grower into his orchard in Winter, and the application made as against the mite will be of use also against the *Pear psylla*, and will destroy many another insect which seeks shelter in crevices and like situations.

In New Jersey this species is abundant, seasonally and locally; but usually noted only early in the year, nearly all trace of the insect's work disappearing by mid-Summer. No permanently injurious effects have been noticed in this State.

Timber Beetles.—Mr. A. D. Hopkins has sent out from the West Virginia Experiment Station a circular to lumber manufacturers asking information concerning injury done to timber by a number of species of wood-borers, mainly *Scolytids* and *Lymexyllids*. The object is to gather statistics, so far as possible, concerning the percentage of defective timber and the actual money loss. It is impossible to repeat the questions asked,

because they refer to illustrations and descriptions of injury which accompany the circular. Of course any information derived from replies to such a circular will be exceedingly imperfect; but will give some information perhaps as to how the commercial value of lumber is affected. Just at the present time pin holes in oak are a positive advantage in the manufacture of "antique" furniture, since it saves putting them in artificially. The circular displays Mr. Hopkins' activity, however, and also the fact that he is devoting his entire energy to the question; the only true way of obtaining permanently valuable results. Ten years would not be more than sufficient to gain a thorough knowledge of the relation of insect life in its relation to the forest trees of a single locality only, and there need be no period of idleness at any season.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

[The Conductors of ENTOMOLOGICAL NEWS solicit, and will thankfully receive items of news, likely to interest its readers, from any source. The author's name will be given in each case for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for certain issue. Twenty-five "extras" without change in form will be given free when they are wanted, and this should be so stated on the MS. along with the number desired. The receipt of all papers will be acknowledged.—ED.

PICTURES for the album of the American Entomological Society have been received from Dr. R. E. Kunze, C. V. Piper, A. G. Weeks, Jr., Ernest André, of France, M. J. Elrod.

EDMOND DE SELYS-LONGCHAMPS was unanimously elected a correspondent of the American Entomological Society at its meeting held Feb. 15, 1894.

Dr. E. H. EAMES, of this city, while out botanizing for specimens of the Virginia Snake-root (*Aristolochia serpentaria*), found a plant upon which were a number of *Papilio philenor* larvæ. The doctor was glad to get the plant, as it is very scarce about here. I attempted to raise them, but could find nothing upon which they would feed; I tried Spice-bush, Sassafras, Smartweed and all the most pungent plants I could find, and they would take to none; one was full grown, and changed to a chrysalis without eating any more.

E. H. Eames is a thorough botanist, and he says that this is the northern limit of the food-plant. I have also found *Junonia cœnia* common about here, but not until after the first of October. *Terias lisa* is also common through September and October.—I. F. MOORE, Jr., Bridgeport, Conn.

A VARIATION IN TACHINID ATTACK.—An instance recently came under my observation which not only appeared to be something of a departure from the ordinary method of attack, as it is usually observed in these parasites, but afforded an illustration of the fact that a protective resemblance or mimicry does not always protect. Ordinarily, the eggs of *Tachina* and closely allied species when deposited on Lepidopterous larvæ, are placed on the dorsal or lateral surface, more frequently the former, and especially on the thoracic segments, where they are least liable to become detached by the victim. In this case the host was the larva of one of the Geometridæ, and when first observed was alive and attached posteriorly to a limb, with the body thrown out at an angle, as is the habit in caterpillars of this family, while the eggs had been placed on the ventral surface of the thoracic segments about the bases of the legs and in the region of the œsophagus. None of the parasites developed to adults, and hence the species cannot be determined. Just what led the parent fly to place her eggs in this locality it is of course impossible to say. A slight movement in the limbs of the larva might, if not already known to the parasite, have led to the discovery of its true nature; but even in that case it would seem that the larva should have been able to defend itself in that quarter and driven the fly to attack a less protected part, even if the latter had not found it out of its own accord.

F. M. WEBSTER.

A BUG GNAWED HIS HEART.—A young boy's death gets a strange explanation. Muncie, Ind., Jan. 19, 1894. A remarkable case of a boy being killed by a bug that gnawed his heart deeply interests local physicians. Samuel Lennox, seven years old, died a few days ago with very peculiar symptoms. The boy had been sick for some time, but his case was different from any other. A post-mortem examination revealed that part of the heart had been eaten away by an insect, causing death. Nearly a year ago the boy drank water from a brook and swallowed a water bug. The insect ate its way through the boy's stomach and then began devouring the heart, the boy bleeding to death.

NOTE.—This is undoubtedly a species of bug we have had occasion to refer to before in the NEWS—humbug.—ED.

A FURTHER note on Oceanic Hemiptera.—The species of *Rhagovelia* mentioned in my article in the February number of the NEWS is, according to a recent communication from Mr. Heidemann, not *collaris*, but a new species which is about to be described by Prof. Uhler as *plumbea*.

H. F. WICKHAM.

THE Texas Goddess of Liberty has more than a bee in her bonnet. She isn't a Populist of the Mrs. Lease order, but a 17-feet high statue poised on the highest pinnacle of the State Capitol at Austin. In cleaning the statue a few days ago it was discovered that a swarm of bees had made their home in the hollow head of the goddess, using the nostrils as an entrance, and had filled it half full of honey.—*New York Sun*.

ASPIDIOTUS NERII.—The distribution of this scale, brought about by human means, is very wide; yet the insect is by no means found everywhere. Curiously enough, the true *A. nerii* is not yet known from the West Indies. In Jamaica the oleander is much cultivated, but no *A. nerii* was to be found; nor is it in Mr. Barber's collections from the Lesser Antilles, or those of Mr. Ulrich from Trinidad. There is a scale on palms in the West Indies that was considered a variety of *nerii*, but I have recently satisfied myself, by the examination of a good deal of material, that it is a quite distinct species, namely *A. destructor* Signoret; and further, that my *A. fallax* and Mr. Newstead's *A. cocotis* are but slight varieties of it. The supposed *A. palmarum* from Barbados is another variety. On the continent, *A. nerii* is known from widely separated points. On August 8th, last year, I found it on a pink oleander in Las Cruces, N. Mex. Dr. A. Dugés sent it to me on oleander from Guanajuato, Mex., where it is known to have existed at least since 1884. It had been recorded from Chili, and a few days ago M. Lataste sent me specimens on oleander and jasmine, from Santiago. It would be interesting to obtain fuller particulars about the distribution of this scale, and I would suggest that those who have the opportunity might examine oleanders in various localities whence it has not been reported, to see if it is really absent, or merely unnoticed. The white scales on the leaves are very conspicuous and could not well be overlooked by any one searching for them.—T. D. A. COCKERELL.

AN EARLY BUTTERFLY.—As evidences of the extraordinary mildness of the season hereabouts friends have been bringing or sending to the *Ledger* office during the past week or two dandelion flowers, pansy or heartsease blossoms, and other floral specimens gathered outdoors in sunny nooks and sheltered places. On Monday, Jan. 23, 1894, these treasures and harbingers of Spring were pleasantly added to by a live and healthy specimen of the pretty yellow butterfly of the species which is so well known to everyone, and which forms the finishing touches to every pastoral scene. This golden specimen of butterfly down was found fluttering happily about the regions of Seventh and Market Streets, and was brought to the *Ledger* office and given the freedom of the editorial rooms. —*Public Ledger.*

THE SILK SPIDER of Madagascar forms the subject of an interesting article in *Die Natur*, by Dr. Karl Muller. Its native name is Halabe, meaning great spider. "This Halabe, or *Mephita madagascariensis*, spins threads of a golden color, and strong enough, according to Maindroin, to hang a cork helmet by. The female spider may attain a length of 15 cm., while the male does not exceed 3 cm. A single female individual, at the breeding season, gave M. Cambone, a French missionary, some 3000 m. of a fine silken thread during a period of about 27 days. The thread was examined with a view to creating a new industry. Small textures woven of these threads are actually used by the natives for fastening flowers on sunshades and for other purposes."—*Public Ledger.*

In the News for October, 1893, p. 270, we reprinted from the "Zoologischer Anzeiger," a new classification of the Tracheate Arthropods proposed by Mr. R. I. Pocock. In "Nature" for Dec. 7, 1893, Mr. Pocock states that Dr. E. Haase has informed him that in *Scolopendrella* the generative openings "are situated on the fourth body-segment. This genus is therefore progoneate, like the *Dilopoda* and *Pauropoda;* but whether it should be ranged with these two classes, or occupy an independent position between the Progoneata and Opisthogoneata, is a question for future discussion." Owing to our not receiving the proof of the note in the October News, certain errors are contained in it which we take this opportunity to correct: line 6, for "Pauropod," read "Pauropoda;" line 7, for "aimple," read "simple;" line 15, for "a," read "aa;" line 17, for "B," read "bb."

In an article on the correct name of the Milk-weed butterfly, published in the "Entomologist's Record" for January 15th, Mr. F. J. Buckell comes to the conclusion that it should be *Anosia archippus*.

Interesting Fossil Insects.—Dr. S. H. Scudder, from Paris, Dec. 2, 1893, contributes a brief article on "The Carboniferous Insects of Commentry, France," to "The American Journal of Science" for February, 1894. He states that he has recently had the opportunity of seeing a considerable part of a collection of fossil insects from the Upper Carboniferous of Commentry, in Central France, and also the illustrations prepared by M. Charles Brongniart, of the Paris Museum, to portray these remains. When M. Brongniart's work appears, "our knowledge of paleozoic insects will have been increased three- or four-fold at a single stroke and an entirely new point of departure for the future opened. No former contribution in this field can in any way compare with it, nor even all former contributions taken together. Besides, it will offer such a striking series of strange forms as cannot fail to awaken the attention of the least curious. One may not enter into details, but mention may simply be made of one species, regarded by M. Brongniart as one of the forerunners of the dragonflies, in which the wings have an expanse of considerably more than two feet (or about seventy centimeters), and of which several specimens are preserved. It is a veritable giant among insects."

Transactions of American Entomological Society, vol. xxi, 1894. No. 1, in press, containing the following articles: Catalogue of the Coleoptera of Alaska, with synonymy and distribution, by John Hamilton, M.D.; Descriptions of new genera and species of Noctuidæ, by J. B. Smith; 6 pls.

Identification of Insects (Imagos) for Subscribers.

Specimens will be named under the following conditions: 1st, The number of species to be **limited to twenty-five** for each sending; 2d, The sender to pay all expenses of transportation and the insects to become the property of the American Entomological Society; 3d, Each specimen must have a number attached so that the identification may be announced accordingly. Exotic species named only by special arrangement with the Editor, who should be consulted before specimens are sent. Send a 2 cent stamp with all insects for return of names. Before sending insects for identification, read page 41, Vol. III, Address all packages to Entomological News, Academy Natural Sciences, Logan Square, Philadelphia, Pa.

Entomological Literature.

SCIENCE. New York, Dec. 29, 1893.—A new mite infecting mushrooms, H. Osborn, figs.—Jan. 19, 1894. Another rope of maggots, W. H. Ward.

ANNALES DES SCIENCES NATURELLES. ZOOLOGIE (7), xv, 6. Paris, Dec. 1, 1893.—Note on the existence in Senegal of a new species of *Prosopistoma*, A Veyssiere, figs.

ZOOLOGISCHER ANZEIGER. Leipsic, Dec. 27, 1893.—On *Chordeuma germanicum* mihi (Diplopoda), C. Verhoeff. Preliminary communication on new observations on the intercalated stage of the Julidæ, a new grouping of the old genus *Julus* and some new and rare Diplopods from Tyrol, id.—Jan. 22, 1894. Preliminary note on the spermatogenesis of *Bombyx mori*, K. T. Nogakushi.

ANNALES DE LA SOCIETE ENTOMOLOGIQUE DE BELGIQUE, xxxvii, 12. Brussels, 1893.—Note on the Attini, A. Forel.

BIHANG TILL KONGL. SVENSKA VETENSKAPS-AKADEMIENS HANDLINGAR; xviii, iv Afd. Stockholm, 1893.—[On nerve endings and fine capillaries in epithelium of lepidopterous larvæ—in Swedish], E. Holmgren, 1 pl.

FLOWERS AND INSECTS—xi, by Charles Robertson. Extract: Botanical Gazette, xviii, pp. 268–274. July, 1893.

BIBLIOGRAPHICAL AND SYNONYMICAL CATALOGUE OF THE DESCRIBED MEMBRACIDÆ OF NORTH AMERICA. By F. W. Goding, M.D., Ph.D. From Bull. Ill. State Lab. Nat. Hist. vol. ?, pp. 391–482. Date?

THE PROCEEDINGS OF THE LINNEAN SOCIETY OF NEW SOUTH WALES (2), viii, 1. Sydney, July 28, 1893.—On the life-histories of Australian Coleoptera, part i, W. W. Froggatt. Revision of the Australian Amarygmides, part ii—the genera *Chalcopterus* (cont.) and *Amarygmus*, Rev. T. Blackburn.

PROCEEDINGS OF THE ROYAL SOCIETY OF VICTORIA (n. s.), V. Melbourne, May, 1893.—Further notes on the oviparity of the larger Victorian *Peripatus*, generally known as *P. Leuckartii*, A Dendy, D.Sc.

THE ANNALS AND MAGAZINE OF NATURAL HISTORY. London, January, 1894.—The endosternite of *Scorpio* compared with the homologous structures in other Arachnida, H. M. Bernard, 1 pl. On the Elateridæ of Japan, G. Lewis.

COMPTE RENDU. SOCIETE PHILOMATHIQUE DE PARIS, Dec. 24, 1893.—Tracheæ and tracheal respiration, J. Martin.

THE OTTAWA NATURALIST, January, 1894.—Hymenoptera Phytophaga, 1893, W. H. Harrington.

REVUE BIOLOGIQUE DU NORD DE LA FRANCE, vi, 3. Lille, December, 1893.—New species of *Thysanura* found in the grotto of Dargilan, R. Moniez.

THE CANADIAN ENTOMOLOGIST. London, Ont., January, 1894.—Description of the preparatory stages of *Phyciodes carlota* Reakirt (*Charidryas ismeria* Scudder), W. H. Edwards. Note on *Copidryas platensis*, A. R. Grote. An entomological trip to Copper Cliff, Ont., W. H. Harrington. Some undescribed stages of Noctuid larvæ, H. G. Dyar. The mottled umber moth (*Hibernia defoliaria* L.), J. Fletcher, figs. Descriptions of two new Hymenopterous parasites from water-beetles, W. H. Ashmead.—February, 1894. A check-list of the Nearctic Coccidæ, T. D. A. Cockerell. Notes on Coleoptera, C. W. Stromberg. Notes upon *Lycæna exilis* Boisd., with descriptions of some of its early stages, W. H. Edwards. On some aquatic larvæ, with notice of their parasites, H. F. Wickham. Descriptions of the larvæ of certain Tenthredinidæ, H. G. Dyar. Food-plants of some Californian Lepidoptera, J. B. Lembert. The genera *Pieris* Schrk. and Euchloe Hb., J. W. Tutt, figs. Additions to the list of Canadian Coleoptera, ii, A. H. Kilman. A very remarkable and anomalous Syrphid with peculiarly developed hind tarsi, C. H. T. Townsend, figs.

DEUTSCHE ENTOMOLOGISCHE ZEITSCHRIFT IRIS, vi, 2. Berlin, Jan. 3, 1894.—The macrolepidoptera of the vicinity of Dresden, H. Steinert and K. Zeidler. Revision of the first group of the genus *Heliconius*, G. Weymer, 2 pls.

THE LOCUSTIDÆ AND BLATTIDÆ OF INDIANA. By W. S. Blatchley. Extract: Proc. Ind. Acad. Sci. 1892, pp. 92–165. Terre Haute, Ind., 1893.

THE ENTOMOLOGIST'S RECORD. London, Jan. 15, 1894.—*Danais archippus*, *Anosia plexippus*, or What ?, F. J. Buckell. Hair tufts and androconia in *Eustroma reticulata*, T. A. Chapman, M.D. Notes on Dr. Buckell's paper on classification, W. F. Kirby. On an additional method for determining the species of Lepidoptera [by the scales], W. S. Riding, M.D. On the larva of *Arctia caja* (cont.), T. A. Chapman, M.D.

SPECIES DES HYMENOPTERES D'EUROPE ET D'ALGERIE. Fondé par Edmond André et continué sous la direction scientifique de Ernest André. 43e fascicule. Gray: Bouffaut Freres. July 1, 1893. Pp. 137–240, Vol. V (Braconidæ, cont.). 44e fascicule, Oct. 1, 1893. Pp. 209–272, pls. iii, v, vi, xi, Vol. VI (Chrysididæ, cont.).

PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, 1893.—The Odonate genus *Ortholestes*, P. P. Calvert, figs.

PROCEEDINGS OF THE NATURAL SCIENCE ASSOCIATION OF STATEN ISLAND, iv, 3. Jan. 13, 1894.—Staten Island Harvest flies, W. T. Davis.

BULLETIN DE LA SOCIETE LINNEENNE DU NORD DE LA FRANCE, xi, 257. Amiens, November, 1893.—Theory of the parasitism of insects, L. Carpentier.

BIOLOGISCHES CENTRALBLATT. Erlangen, Jan. 1, 1894.—On the origin of the social life among Hymenoptera, C. Emery.—Jan. 15, 1894. The origin and formation of the worker stage among ants, C. Emery. On the morphology, biology and pathology of the "Nonne" [*Psilura monacha*], E. Wasmann.

ZOOLOGISCHE JAHRBUCHER, vii, 4. Jena, Dec. 23, 1893.—Contributions to the knowledge of the North American Ant fauna, C. Emery, 1 pl.

ZEITSCHRIFT FUR WISSENSCHAFTLICHE ZOOLOGIE, lvii, 2. Leipsic, Dec. 31, 1893.—Contributions to the knowledge of the colors of Insects' scales: 1. Lepidoptera, 2. Coleoptera, F. Urech.

THE AMERICAN NATURALIST. Philadelphia, January, 1894.—Courtship among the flies, J. M. Aldrich.

PSYCHE. Cambridge, Mass., February, 1894.—The habits of the aculeate Hymenoptera, i, W. H. Ashmead. New and undescribed genera and species of West African Noctuidæ, ii, W. J. Holland, figs., 1 pl. Hermann August Hagen, Eds. Wilhelm Julich, T. L. C.

MITTHEILUNGEN DER SCHWEIZERISCHEN ENTOMOLOGISCHEN GESELLSCHAFT, ix, 1. Schaffhausen, 1893.—Contributions to the knowledge of the Hymenopterous fauna of Switzerland, T. Steck. List of Lepidoptera taken at electric lights in Bern from May to October, 1892, R. Benteli. Coleoptera helvetica, pp. 321–352, Dr. G. Stierlin.

TRANSACTIONS OF THE AMERICAN ENTOMOLOGICAL SOCIETY, xx, 4. Philadelphia, Oct.-Dec., 1893.—Notes on Bees, with descriptions of new species, C. Robertson. Notes and descriptions of Pselaphidæ, with remarks on the Scydmænidæ, E. Brendel, M.D., 1 pl. A synopsis of the Harvest-Spiders (Phalangiidæ) of South Dakota, C. M. Weed, 1 pl. The Cosmetidæ of the United States, id., 1 pl. Seventh contribution to a knowledge of certain little-known Aphididæ, id., 1 pl. The entomology of the mid-alpine zone of Custer County, Colo., T. D. A. Cockerell.

THE AMERICAN JOURNAL OF SCIENCE (3), xlvii, 278. New Haven, February, 1894.—The Carboniferous Insects of Commentry, France, S. H. Scudder.

CORNELL UNIVERSITY AGRICULTURAL EXPERIMENT STATION. Bulletin 61. Ithaca, N. Y., December, 1893.—The pear-leaf blister (*Phytoptus pyri*), M. V. Slingerland.

THE KANSAS UNIVERSITY QUARTERLY, ii, 3. Lawrence, Kans., January, 1894.—New genera and species of Dolichopodidæ, J. M. Aldrich. Descriptions of North American Trypetidæ, with notes, W. A. Snow, 2 pls.

TWENTY-FOURTH ANNUAL REPORT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1893. Toronto, 1894.—Injurious insects of the year, J. Fletcher, figs. Annual address of the president, W. H. Harrington, figs. Entomological mistakes of authors, Rev. T. W. Fyles. The season of

1893, id., figs. Mosquitoes, J. A. Moffat, figs. Canadian Uroceridæ, W. H. Harrington. Additional notes on Japanese insects, id. Notes and queries, Rev. W. J. Holland, figs. The Dragonfly, T. J. MacLaughlin, figs. The song of *Thyreonotus*, W. T. Davis. Notes on some of the more important entomological exhibits at the Chicago Exhibition, J. Fletcher. A contrasted summary of the main external characters of Butterflies in their different stages of life, S. H. Scudder. Some of the papers read at the last meeting of the Economic Entomologists are here reprinted, for a full list of which, see ENT. NEWS for February, p. 52, under "Insect Life."

THE FIFTH ANNUAL REPORT OF THE AGRICULTURAL EXPERIMENT STATION OF THE STATE AGRICULTURAL COLLEGE, Fort Collins, Colo., for the year 1892. 1894. Report of the section of Entomology, C. P. Gillette.

THE ENTOMOLOGIST. London, February, 1894.—On an unusual number of monstrosities occurring in *Eros* (*Platycis*) *minutus* F., J. W. Shipp. On the vertical distribution of the British Lepidoptera (concl.), W. H. Bath. A catalogue of the Lepidoptera of Ireland (cont.), W. F. de V. Kane. Remarks on certain genera of Coccidæ, W. M. Maskell. Notes on the synonomy of Noctuid moths (cont.), A. G. Butler. Protective resemblances in S. American insects, W. C. Mit.

THE ENTOMOLOGIST'S MONTHLY MAGAZINE. London, February, 1894. —Notes on some British and exotic Coccidæ (No. 27), J. W. Douglas. Additions and corrections to the list of British aculeate Hymenoptera, E. Saunders. Grease, R. Freer. Notes on the earlier stages of the Nepticulæ (cont.), J. H. Wood.

NEW SPECIES OF NORTH AMERICAN INSECTS DESCRIBED IN THE PRECEDING LITERATURE.

ACARINA.

Tyroglyphus lintneri Osborn, Science, xxii, p. 360. N. Y.?

COLEOPTERA.

Pselaphidæ, Scydmænidæ: n. spp. U. S., Brendel, Trans. Am. Ent. Soc. xx, pp. 277–284.

DIPTERA.

Dolichopodidæ: n. gen. et spp. U. S., Aldrich, Kans. Univ. Quart. ii, pp. 151–157.

Trypetidæ: n. gen. et spp. U. S., Snow, Kans. Univ. Quart. ii, pp. 159–174, pls. vi, vii.

Syrphidæ: *Calotarsa* n. gen. Townsend, Can. Ent. xxvi, p. 50. Type *C. ornatipes*, p. 52, figs., Ill.

HEMIPTERA.

Membracidæ: n. gen. et. spp. U. S., Goding (see ante).

HYMENOPTERA.

Gausocentrus gyrini Ashmead, Can. Ent. xxvi, p. 25, Ia. *Cyrtogaster dineutis*, p. 26, Ia.

Formicidæ: n. spp. U. S., Emery, Zool. Jahrb. vii, pp. 633–681.

Apidæ: n. spp. U. S., Robertson, Trans. Am. Ent. Soc. xx, pp. 273–276.

Monostegia quercus-coccineæ Dyar, Can. Ent. xxvi, p. 42, Mass.

ODONATA.

Ortholestes abbotti Calvert, Proc. Ac. N. S. Phila. 1893, p. 382, fig. 3, Hayti.

ORTHOPTERA.

Ceuthophilus latisulcus Blatchley, Proc. Ind. Acad. Sci., 1892, p. 146, Ind.

The Entomological Section

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

PROCEEDINGS OF MEETINGS.

JANUARY 25, 1894.

A regular stated meeting of the Entomological Section of the Academy of Natural Sciences was held in the Hall, S. W. cor. Nineteenth and Race Streets, this evening, Dr. G. H. Horn, Director, presiding. Members present: Liebeck, Seiss, Calvert, Ridings and Skinner. Associates: Fox, Boerner and Dr. Griffith. Mr. Calvert spoke of the work by Prof. Comstock on evolution and taxonomy, and read passages therefrom. The only previous work of any moment on this subject and relating specially to wing structure was that of Redenbacher, written in 1886. Redenbacher's views on the primitive structure of the wing were given by the speaker. The views of Prof. Comstock on this subject were also given and explained by the aid of blackboard sketches. Reference was made to the neuration of dragonflies, and comparisons made with the wing structure of some of the other orders. Dr. Horn considered the methods pointed out by Prof. Comstock as the proper way to study. The question should always be asked oneself when any new anatomical structure is found, why is it? what does it mean? Mr. Calvert exhibited a Coleopterous larvæ collected last September in a small stream in Delaware County, under and clinging to stones. At first glance it appeared to be an Isopod crustacean, but Mr. Liebeck had identified it as a Parnid larva, *Dryops* sp. Specimens were also taken by Mr. Moore at West Spring Hill, Delaware County, Pa. Dr. Horn stated that the larva had been actually described as a crustacean.

FEBRUARY 15, 1894.

Meeting held this evening, Dr. Horn, Director, presiding. Members present: Laurent, Seiss, Skinner, Ridings, Johnson, Calvert, Liebeck. Associates: Fox, Nell. The Publication Committee reported in favor of publishing the following paper in the Trans. Am. Ent. Soc.: "A Prelimi-

nary view of the Lepidopterous Family Notodontidæ," by B. Neumoegen and H. G. Dyar. Mr. Calvert stated that in studying the genera of dragonflies he had been led to investigate the value of photography as a means of illustrating the neuration. He put the specimens in an ordinary spreading board and put the blue print paper beneath the wings and placed glass slips over the wings and placed them in the sun. This gave a print with the veins in white and a blue back ground. He then went over the white veins with India ink and then dissolved the blue back ground with sodium carbonate, and this gave the neuration black on a white back ground. The method was not as satisfactory as could have been wished on account of the smallness of the printed parts, which, of course, were only as large as the original wings. The results of the experiments were shown by aid of specimen prints. Dr. Horn said that some time in the near future he intended to present some thoughts on the family Meloidæ, and said he took exception to the present classification of the Meloïini, which he considered unnatural. Mr. Fox called attention to a specimen of *Stizus unicinctus* which he exhibited. It lacked the usual red band on abdomen which is possessed by the normal form.

The following papers were read and accepted by the Committee for publication in ENTOMOLOGICAL NEWS:

STUDIES AMONG THE FOSSORIAL HYMENOPTERA.—I.

Synopsis of the North American Species of Alyson.

By WILLIAM J. FOX.

ALYSON Jurine.

Alyson Jur., Nouvelle Méthode, 195, 1806; Handlirsch, Sitzb. Akad. Wiss., Wien, Math.-naturw. classe, xcvi, p. 235.

FEMALES.

1. Median area of metanotum triangular . . . . . 5.
   Median area of metanotum semielliptical, or U-shaped . . . . . 2.
2. Thorax black . . . . . 3.
   Thorax red; legs, except hind tibiæ red . . . . . **melleus.**
3. Abdomen not at all red . . . . . 4.
   Abdomen on two basal segments red; median enclosure of metanotum coarsely reticulated, the posterior face of metathorax when viewed from behind is bidentate laterally . . . . . **oppositus.**
4. Enclosure on metanotum at the base nearly as broad as it is long, and enclosing seven or eight distinct, longitudinal, radiating ridges; clypeus entirely yellow; wings subfuscous . . . . . **radiatus.**
   Enclosure on metanotum decidedly longer than it is broad at the base, irregularly and rather finely rugose; clypeus with a dark blotch in the middle; wings, except the usual fuscous cloud, subhyaline. **conicus.**
5. Abdomen black; clypeus, and greater part of legs, black . **guignardi.**
   Abdomen on two basal segments red; clypeus yellow; legs fulvous. **trianguliferus.**

MALES.

1. Median area of metanotum triangular . . . . . 5.
   Median area of metanotum semielliptical, or U-shaped . . . . . 2.
2. Within the median area the metanotum is coarsely reticulated . . 3.
   Within the median area the metanotum is not at all reticulated . . 4.
3. Legs and clypeus black . . . . . **oppositus.**
   Legs, except hind tibiæ, fulvous; clypeus yellow . . . . . **melleus.**
4. Area of metanotum enclosing numerous distinct, radiating ridges; clypeus and flagellum beneath, yellow . . . . . **radiatus.**
   Area of metanotum finely rugose, with two diverging, central, longitudinal ridges; clypeus yellow, black medially; flagellum testaceous beneath . . . . . **conicus.**
5. Median area of metanotum exactly triangular, without a transverse ridge before the apex; legs fulvous, the four anterior coxæ yellow. **triangulifer us.**
   Median area of metanotum with a transverse ridge before apex, which gives the area the appearance of being semielliptical . . . . 6.
6. Mesopleuræ punctured throughout . . . . . **guignardii.**
   Mesopleuræ on lower portion coarsely striated . . . . . **striatus.**

1. **Alyson oppositus** Say.

A. oppositus Say, Bost. Jour. Nat. Hist. i, p. 380, ♂♀; Packard, Proc. Ent. Soc. Phila. vi, p. 421.

Occurs from Canada to Virginia; Colorado.

2. **Alyson melleus** Say.

A. melleus Say, l. c. p. 380, ♀; Provancher, Add. Hym. Quebec, p. 270, ♀♂, December, 1887.

Canada to Mexico; Illinois. The credit for describing the ♂ of this species should be given to Provancher, whose description appeared in December, 1887, while that of Handlirsch, who also describes a ♂ apparently for the first time, did not appear until early in 1888.

3. **Alyson radiatus** n. sp.

♀.—Black; scape beneath, clypeus, spot between insertion of antennæ, inner orbits reaching beyond middle of the eye, mandibles except tips and extreme base, and the anterior legs in front, yellow; the anterior coxæ and trochanters are black on basal portion; four hind tibiæ, tarsi and tips of femora reddish testaceous maculæ; on second segment white; wings subfuscous or dark subhyaline, the usual cloud in the vicinity of the marginal and submarginal cells very faint; stigma pale testaceous, the nervures much darker. Front finely and closely, yet distinctly punctured, the vertex perhaps more distinctly so; anterior margin of clypeus indistinctly bidentate medially; first joint of flagellum not more than one-fifth longer than the second; dorsulum and scutellum finely and rather closely

punctured, the latter distinctly impressed; enclosure of metathorax nearly as broad at the base as it is long, and with numerous strong, radiating ridges; outside of this enclosure the metathorax is coarsely rugose, except on the metapleuræ; abdomen shining, the first two dorsal segments scarcely punctured. Length 7 mm.

♂.—Antennæ beneath, four hind tibiæ and tarsi in front and the parts mentioned in the description of the ♀, yellow; wings subhyaline; first joint of flagellum decidedly shorter than the second, which is in turn slightly shorter than the third, last joint curved. Length 7 mm.

Nevada, Colorado. The form and sculpture of the enclosure of metanotum will distinguish it.

4. **Alyson conicus** Prov.

A. conicus Prov., l. c. p. 271, ♀.

♂.—Black; inner orbits as far as centre of front, scape and pedicellum beneath, mandibles except tips, clypeus, except spot in middle (sometimes the clypeus is entirely black), apex of anterior coxæ, as well as the fore femora and tibiæ in front, yellow; four posterior tibiæ, tarsi and apex of femora testaceous; flagellum beneath obscurely testaceous; wings subhyaline, iridescent, nervures and stigma testaceous; first joint of flagellum but little more than half as long as the second, which is in turn slightly shorter than the third; front finely and closely punctured, strongly impressed medially; scutellum impressed; metathorax bluish, the enclosure shorter than in the ♀; abdomen shining, first two dorsal segments impunctate. Length 5.5 mm.

Canada. One ♂ specimen has the flagellum yellowish beneath.

5. **Alyson guignardii** Prov.

A. guignardii Prov., l. c. p. 271, ♀♂.

Canada; Illinois.

6. **Alyson striatus** n. sp.

♂.—Black; scape beneath, clypeus entirely, sides of face, inner orbits as far as centre of front, mandibles except tips, two spots on prothorax above and apical portion of anterior coxæ, yellow; legs yellow-testaceous, or pale-yellow, flagellum brownish beneath; maculæ on second segment white, transversely elongate; wings subhyaline, iridescent, nervures testaceous; the head, thorax and abdomen is clothed with a rather conspicuous, oppressed pubescence. Anterior margin of clypeus slightly incurved; front finely and closely punctured, strongly impressed medially; first joint of flagellum but little more than half as long as the second, this latter joint fully as long or slightly longer than the third; last joint curved as usual; dorsulum and scutellum with tolerably fine and close punctures, the scutellum not impressed; enclosure on metanotum triangular, with a strong transverse ridge before the apex, which gives it the appearance of being semielliptic, within the enclosure there are two strong, longitudi-

nally diverging carinæ; with exception of the space between these carinæ and the metapleuræ, the metathorax is coarsely rugose; the mesopleuræ on lower portion with coarse, longitudinal striations; abdomen with the last segment reddish. Length 7 mm.

District of Columbia. Easily distinguished by the striated mesopleuræ.

7. **Alyson trianguliferus** Prov.

A. triangulifer Prov., l. c. p. 272, ♂.

♀.—Black; first and second abdominal segments red; mandibles, except tips, clypeus, orbits as far as middle of front, scape, first two or three joints of flagellum beneath and tubercles, yellow; legs entirely fulvous, the anterior pertaining to yellowish; front finely and evenly punctured, vertex likewise; first joint of flagellum, if anything, a little longer than the second; prothorax and dorsulum with fine and close, but distinct punctures, the prothorax on sides indistinctly striated; scutellum not impressed, the suture which separates it from the dorsulum strongly foveolated; enclosure on metanotum almost exactly triangular, within with somewhat irregular ridges, posterior face of metathorax rugose; wings subhyaline, iridescent, with a fuscous cloud in the vicinity of the marginal and submarginal cells; the abdomen, especially beneath, is clothed with long, sparse, dark hairs. Length 7–8 mm.

Massachusetts, Virginia, Illinois. Resembles the ♀ of *oppositus*, but the shape of metanotal enclosure will distinguish it as well as the color of legs.

———o———

SOME NEW AND LITTLE-KNOWN AFRICAN HESPERIIDÆ.

By W. J. Holland, Ph.D., D. D., F. Z. S., etc.

The species described and figured in the following paper are represented in my own collection by the types, or by authentically determined specimens. The figure of *Tagiades dannatti* Ehrmann, recently described in the pages of the Entomological News, is represented by a drawing which I have carefully made from the type. I am inclined to think that this species is identical with *T. lacteus* Mab., described in the Bulletin of the Entomological Society of France, ser. 5, vol. vii, p. xxxix. The description given by Mons. Mabille tallies well with the insect figured, save in one or two minor particulars. *Calænorhinus atratus* Mab., *C. illustris* Mab., and *C. interniplaga* Mab., which were described a couple of years ago by Mons. Mabille in the "Comptes Rendus," of the Belgian Entomological Society, being there referred to the genus *Pardaleodes*, are known to me

by the types, which I saw in the possession of Mons. Mabille upon the occasion of my last visit to Paris. While I did not have specimens of these species with me at the time for purposes of comparison, the insects before me agree so well with the descriptions given by Mons. Mabille, and with the hasty pen and ink outlines I drew at the time, that I am quite confident that there is no error in the determinations given. *Celænorhinus collucens* mihi, I had determined as *C.* (*Pardaleodes*) *lucens* Mab., but my good friend, Dr. Scudder, who recently did me the great kindness of comparing a set of drawings of some of the Hesperiidæ in my collection with those contained in the collection of Mons. Mabille and other great European collections, assures me that my species, while very near *C. lucens* Mab., is manifestly distinct, the mesial band on the primaries being much broader in *C. lucens* than in my species.

I hope shortly to be able to publish a revision of the Hesperiidæ of Africa and the adjacent islands, and for this purpose am having drawings made of the types of the hitherto unfigured species which are contained in the museums of Europe. The work is one of some magnitude, and is attended with considerable expense, but will prove a great boon to working naturalists, unless I am greatly mistaken.

CELÆNORHINUS, Hübn.

1. **C. collucens** sp. nov. ♂.—Allied to *C. lucens* Mab., MS? The upper side of the head, thorax, and abdomen is fuscous, clothed with olivaceous-green hairs. The lowerside of the thorax and abdomen are much paler. The palpi on the lower side are ochraceous. The antennæ, which are blackish, are marked with ochraceous on the underside at the tip and just after the club. The primaries are dark brown clothed with greenish olivaceous hairs at the base. They are traversed by a broad translucent mesial band of bright waxen-yellow, on the costa and near the outer angle showing bright lemon. This band is somewhat regularly indented on the innerside and very irregularly indented on the outer margin. In addition, there are three large, translucent, subapical spots. The secondaries are dark brown or blackish, heavily clothed with greenish hairs at the base, and with a few patches of similar hairs beyond the cell. Upon the outer margin, just below the outer angle, is a broad lemon-yellow spot. On the underside the ground color of both wings is much paler. The markings of the primaries reappear on this side, and, in addition, the costa near the base is yellowish. The secondaries are without the large lemon-yellow spot near the outer angle, and are slightly clouded with darker brown.

♀.—The female is much like the male, but larger, and on the secondaries has the large yellow spot replaced by two or three small circular spots. These spots reappear indistinctly upon the underside. Expanse: ♂, 38-40 mm.; ♀, 45 mm.

Hab.—Valley of the Ogové.

OSMODES Wats.

2. **O.** (?) **fan*** sp. nov. ♂. Upperside of palpi, head, thorax and abdomen dark brown; lowerside of thorax and abdomen slightly paler brown; legs blackish; the underside of the palpi at the base whitish. The primaries on the upperside are black, crossed from the costa to the submedian nerve by a broad orange-red mesial band, irregularly dentate inwardly, and irregularly angulated and indented outwardly. The secondaries on the upperside are dark brown or blackish. The primaries on the underside are as on the upperside, save that the mesial band shades into creamy white in the neighborhood of the submedian nerve, and there are two small white subapical dots near the costa, and another small white dot between the second and third median nervules near the outer margin. The secondaries upon the lowerside are dark fuscous, clouded with darker brown transverse bands and subapical spots. Expanse 30 mm.

This beautiful species is allied to *O.? vibius* Hew. The single specimen in my collection is from the Bule country, one hundred miles back from the coast at Great Batanga, in a region about 1800 feet above the level of the sea.

PARNARA Moore.

3. **P.** (?) **picanini**† sp. nov. ♂.—Upperside of head, thorax and abdomen black; lowerside of palpi and pectus broadly white; femora and adjacent parts of thorax grayish; legs black; lowerside of abdomen blackish. The primaries on the upperside are black. There are some olivaceous hairs at the base. The inner margin at the base is narrowly edged with pale grayish hairs. Just above the outer extremity of this pale streak is a small linear white translucent spot. At the end of the cell are two similar translucent linear spots, and below the cell at the origin of the second median nervule a curved narrow elongated translucent white spot. There are three small translucent submarginal spots nearer the cell than the margin, two of them approximating each other, located one on either side of the third median nervule near its origin. The uppermost of the three is located beyond the end of the cell. The secondaries are black on the upperside, like the primaries, with a grayish ray extending from the base for a short distance along the submedian nerve. There is a transverse macular band beyond the cell, consisting of three or four spots, the two outer spots being pure white, the inner spots being obscured by grayish hair. There are one or two small obscure spots near the anal

* Fan = *Nomen tribus Africanæ.*

† *Nomen puelli apud Africanos in America, nonnunquam etiam in Africa, habitantes.*

angle. On the underside the primaries are marked as on the upperside, but the spot near the submedian nervule is transformed into a somewhat vaguely defined elongated ray, and there is a very narrow white line bordering the cell on its upperside at the base. The secondaries on the lowerside are marked by a broad, white, transverse band, irregularly dentate outwardly, and interrupted in the region of the submedian nerve. Expanse 28 mm.

The type, which is unique, was taken by Dr. Good in Liberia.

4. **P. mabea*** sp. nov. ♂.—Upperside of head, thorax and abdomen dark brown; lower side of thorax and abdomen dark brown, covered with grayish hairs; legs concolorous. The primaries on the upperside are dark brown, marked by eight translucent spots, two above each other at the end of the cell: a triangular silvery white spot, with its base resting upon the middle of the submedian nerve; a larger subquadrate spot between the first and second median nervules, with its outer lower angle produced toward the margin; a smaller subquadrate spot between the second and the third median nervules, and three small subapical spots arranged in a curved series below the costa. The secondaries on the upperside are dark brown with two elliptical translucent white spots beyond the cell separated by the second median nervule. On the underside the primaries are slightly paler than on the upperside, with the region of the cell darker than the remainder of the wing. The spots of the upperside reappear on the underside. The secondaries are dark fuscous, inclining slightly to reddish on the lowerside; and in addition to the two elliptical spots, which appear on the upperside, there is a circular white spot at the end of the cell, and a somewhat smaller spot before the outer angle midway between the margin and the cell. Expanse 32 mm.

This species is represented in my collection by a single specimen coming from the valley of the Ogové.

5. **P. batangæ** sp. nov. ♂.—Closely allied to *P. picanini*, but much larger, and without the basal streak on the inner margin of the primaries, and with the outer margin of the primaries not as deeply excavated before the inner angle, as in that species. On the underside the primaries are much as in *P. picanini*, but the secondaries on the underside are wholly different, being light gray clouded, with very pale fuscous in the region of the anal angle, with the fringes very pale fuscous inclining to whitish. The wing is marked by an irregularly curved series of pale whitish spots, two at the end of the cell, four composing a transverse series, the two outermost being small, located on either side of the second median nervule near its origin, the third, and largest, being separated from the fourth, which is small and linear, by the submedian nerve. Expanse 32 mm.

Hab.—Batanga, German West Africa.

* *Mabea = Nomen gentis Africanæ.*

6. **P. argyrodes** sp. nov. ♂.—The upperside of the thorax and abdomen dark brown, clothed lightly with grayish hairs at the insertion of the wings. On the underside the thorax and abdomen are dark brown. The legs are concolorous. The primaries on the upperside are black, marked by a subquadrate spot at the end of the cell constricted near the middle. There are three subquadrate spots on the median interspaces beyond the cell regularly diminishing in size toward the apex, and two or three minute subapical spots forming a curved series near the costa. The secondaries on the upperside are black with two minute and obscure spots beyond the end of the cell, the inner fold of the wing near the base being clothed with grayish green hairs. On the underside the primaries are dark brown, becoming paler toward the outer margin, and slightly laved with purplish brown. The spots of the upperside reappear, and in addition there is a whitish spot above the submedian nerve. The secondaries are dark brown tinged with purplish on the outer margin and having the fringes very pale fuscous. The middle of the wing is traversed by a somewhat irregularly curved series of four silvery spots, the innermost of which is the largest. Expanse 30 mm.

Hab.—Valley of the Ogové.

7. **P. leucophæa** sp. nov. ♂.—Upperside of head, thorax and abdomen black; lowerside of palpi inclining to ochraceous; lowerside of thorax and abdomen grayish; legs concolorous. The primaries on the upperside are black, margined with glaucous hairs on the inner margin at the base. There are two round spots at the end of the cell: three forming a median series beyond the cell, the lower spot on the submedian nerve being small, quadrate, silvery white; the second and third on the middle interspaces, the second the largest. In addition there are three subapical spots forming a curved series near the costa. The secondaries on the upperside are black with two oval white spots, one on either side of the second median near its origin, the uppermost being the largest. The fringes at the anal angle are broadly white. On the underside the primaries are marked much as on the upperside, but the spots are not so sharply defined as on that side. The secondaries are blackish. There is a small white spot at the end of the cell, and three similar small spots forming a transverse series beyond the cell. These spots are bordered with blackish. The outer third of the wing toward the anal angle is washed with bluish gray, upon which the nervules, which are dark, stand out distinctly. The fringes at the anal angle are broadly white, and the white color of the fringe runs inwardly as a whitish ray along the submedian nervule.

♀.—The female is marked like the male, but the secondaries are more broadly whitish at the anal angle, and have, in addition, a white spot annulated with dark brown beyond the end of the cell near the outer angle. Expanse: ♂, 30 mm.; ♀, 34 mm.

Hab.—Valley of the Ogové.

Mons. Mabille, to whom I showed the type, declared the spe-

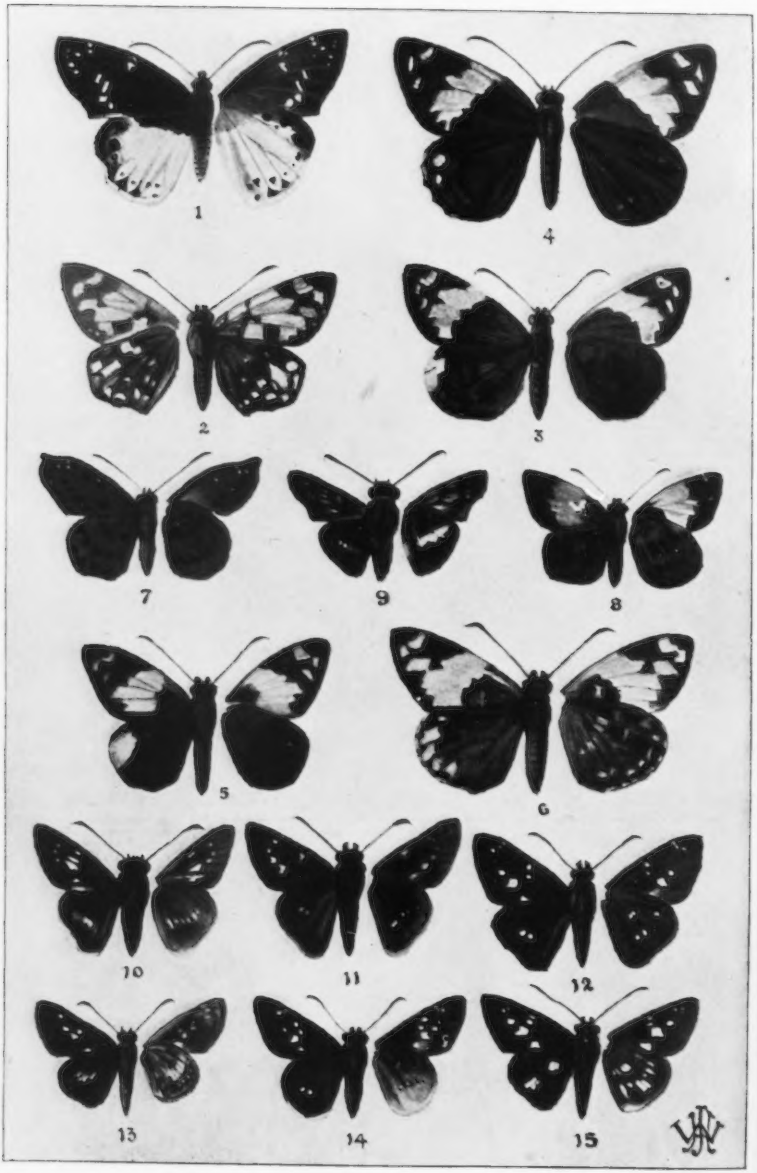
cies to be unknown to him. It is not found in the British Museum. In some respects it is closely allied to *P. indusiata* Mab., but totally distinct.

8. **P. (?) subnotata** sp. nov. ♂.—Upperside of thorax and abdomen fuscous; lowerside of thorax and abdomen fuscous, inclining to ochraceous; lowerside of palpi whitish; legs fuscous. The primaries on the upperside are dark brown. There is a small spot at the lower angle of the cell at its end. There are three spots forming a median series, the lower most white, subtriangular, and opaque, resting on the submedian nerve about its middle. The second, which is the largest and subquadrate, is located just below the spot at the end of the cell. Above it is a smaller subquadrate spot lying between the second and third median nervules at their origin. In addition there is a similar subquadrate spot below the costa beyond the end of the cell midway between it and the apex. The secondaries are dark brown, marked by a curved band of semi-translucent yellowish spots located beyond the cell near the origin of the median nervules. On the underside the primaries are brownish fuscous. The translucent spots reappear on this side, but are less distinct. The base is laved with ochraceous, as is also the outer margin near the apex. The outer margin is ornamented by a series of dark spots forming a regularly curved band from the apex to the second median nervule, where they are lost in the darker ground color of the wing. These spots are defined inwardly by pale yellowish hastate markings. There is a fine marginal black line. The fringes are dark fuscous. The secondaries on the lowerside are ochraceous, the middle area beyond the cell being traversed by a somewhat broad band of bright yellow spots running from the costa to the first median nervule. There are four or five blackish spots between this band and the base pupiled with pale ochraceous. There is a regularly curved submarginal series of blackish spots defined inwardly by paler markings. The margin and the fringes are as on the primaries. Expanse 26 mm.

This species probably does not belong to the genus *Parnara*, though without a dissection its exact location cannot be absolutely determined. It probably comes nearer the genus *Osmodes*, though it does not belong to it, and may perhaps represent the type of a new genus.

GASTROCHÆTA Mab.

9. **G. cybeutes** sp. nov. ♂.—The upperside of the body is black. The lowerside is grayish white. The antennæ are marked with white at the end of the club. The primaries on the upperside are black. There are two elongated translucent white spots at the end of the cell very near to each other, a median series of three moderately large translucent spots, of which the lower spot resting on the submedian nerve is oblong, quadrate, silvery white, the second is subhastate with its point obtuse pointing



See page 89.

AFRICAN HESPERIIDÆ Holland.

inwardly, the third, the smallest of the series, lying between the origin of the second and third median nervules. There is a subapical curved series of three small white translucent spots. The secondaries have a round translucent white spot beyond the base divided by the nervule which defines the upper margin of the cell. This spot is partly obscured by the grayish hairs which cover the base. Beyond the cell are two oblong subquadrate spots separated from each other by the second median nervule. The fringes of the secondaries are pale. On the underside the primaries are pale greenish fuscous with the middle area deep blackish. The spots on the underside are as on the upperside. The secondaries are greenish fuscous with the anal angle broadly laved with whitish. There are two series of spots forming macular bands, one crossing the cell, the other beyond it. The inner series consists of three spots, the uppermost of which is large and oval. The two innermost spots are smaller, opaque, and accentuated outwardly by blackish markings. The outer band of spots is composed of a curved series of eight spots, of which the third and fourth reckoning from the inner margin, are translucent and the largest; the second and fifth are minute; the first and sixth are linear, the first being the larger; the seventh is minute and circular; and the eighth, which is nearest the costa, is linear.

♀.—The female is marked very much like the male, but the secondaries on the underside are broadly whitish on the middle area and toward the base, with the outer margin clouded with dark brown. The two bands of spots are separated near the inner margin by a brownish area like that on the outer margin. The spots are all more or less obscurely defined in the female, their outlines being lost in the paler ground color of the wing. Expanse: ♂, 32 mm.; ♀, 37 mm.

Hab.—Valley of the Ogové.

Mons. Mabille, who has seen this species, regards it as an undescribed. It is not found in the British Museum, nor in the museum at Berlin.

EXPLANATION OF PLATE III.

Fig. 1. *Tagiades dannatti* Ehrmann, ENT. NEWS, vol. iv, p. 309.
" 2. *Celænorhinus interniplaga* Mab., C. R. S. Ent. Belg. '91, p. lxxiii.
" 3. " *colluscens* sp. nov. ♀.
" 4. " *colluscens* sp. nov. ♂.
" 5. " *atratus* Mab., C. R. Soc. Ent. Belg. 1891, p. lxxiv.
" 6. " *illustris* Mab., l. c. p. lxxiii.
" 7. *Procampta rara* Holl., Ann. and Mag. N. Hist. (6), vol. x, p. 293.
" 8. *Osmodes? fan* sp. nov.
" 9. *Parnara picanini* sp. nov.
" 10. " *batangæ* sp. nov.
" 11. " *argyrodes* sp. nov.
" 12. " *mabea* sp. nov.
" 13. " (?) *subnotata* sp. nov.
" 14. " *leucophæa* sp. nov.
" 15. " *cybeutes* sp. nov.

Description of a new species of Myscelia from Western Mexico.

By LEVI W. MENGEL, Reading, Pa.

Myscelia skinneri nov. sp.—Expands two and one-quarter inches. The basic color of the entire upper surface is black, paling slightly along the internal margin of the inferior wings. Beginning at the base of the superior wing, running into the discoidal cell about three-eighths of an inch, dividing, and running into the wing nearly three-quarters of an inch, is a blotch of rich purple. Along the margin of the wing is a line of white or pale bluish spots, broken, running along the entire margin. There is a parallel line of spots, nearly the same color, though somewhat darker, running very close to the edge. There are two white apical spots surrounded by the faintest tinge of blue, three submarginal spots, and two in the centre of the costa, all of the same color. The inferior wings are emarginate, with a thin, pale, broken line of white spots running along the edge. A large blotch of the same rich purple as on the superiors spreads from the base into the cell, extending almost to the upper margin of the wing. It is not divided, as in the superiors. Near the margin is a row of purple spots running parallel to the edge. A second and third marginal row run across the wing. Between the last row and the large blotch runs a band across the wing in the centre. Counting this row, and excluding the white marginal line, there are *four* rows of these purple-colored spots between the edge and blotch. The undersides of the wings, as in *M. streckeri* Skinner, resemble the under surface of *Pyrameis atalanta*, and, like it, cannot be described.

The species is close to *M. streckeri* Skinner, and they may be varieties of the same species belonging to the same zoölogical area. But in the general appearance, and in the number of rows of purple spots, from which there is *no variation* in *skinneri*, they differ to such a degree that I believe the species is worthy of a name.

Described from five specimens from Bayemena, Sinoloa, Mex. Named in honor of Dr. Henry Skinner, of Philadelphia.

OBITUARY.

MORITZ SCHUSTER died of apoplexy Feb. 7, 1894. Mr. Schuster was born in Germany in 1823, and was an enthusiastic entomologist up to the time of his death. His home was at 1803 Hickory Street, St. Louis, Mo.

ENTOMOLOGICAL NEWS for February, was mailed Jan. 31, 1894.

EXCHANGES

Not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at end of the column, and only when necessary those at the top (being longest in) are discontinued.

Coleoptera of N. Am. and Mexico wanted by purchase or exchange; large collection.—Fred. C. Bowditch, Tappan St., Brookline, Mass.

Lepidoptera.—Wanted, *Plusia balluca, metallica* and *ampla;* also the Hydrœcias. Have some of the rarer eastern Noctuids for exchange.—Henry Bird, Rye, N. Y.

Coleoptera and **Hemiptera**, European and exotic, also postage stamps of Roumania, offered for American Hemiptera-Heteroptera unnamed.—A. L. Montandon, Strada Viilor filarete, Bucarest, Roumania.

Lepidoptera.—Good exchange or cash given for specimens of *Nadata doubledayi* Pack. Also wanted any of the rarer Notodontidæ and Limacodidæ.—Harrison G. Dyar, 599 Broadway, New York City.

Coleoptera.—I wish to obtain Entomological literature in any language, especially that treating of Coleoptera and for works not in my possession will give good insects from the West and from Alaska, mostly Coleoptera.—H. F. Wickham, Iowa City, Iowa.

Coleoptera.—Price-lists wanted.—Dr. E. B. Stephens, Plymouth, Mass.

Cynipidæ.—Named or unnamed Cynipidæ wanted by purchase or exchange. Always accompany the flies with their galls when possible.—C. P. Gillette, Ft. Collins, Col.

Orthoptera.—For exchange: Mexican Lepidoptera, unmounted, for literature, in any language, on N. A. Orthoptera. Also Indiana Orthoptera for others from any part of N. A.—W. S. Blatchley, Terre Haute, Ind.

Orthoptera.—I desire to procure, by purchase, exchange, or for identification, specimens of the genus *Spharagemon* from all parts of the country.—Albert P. Morse, Wellesley College, Wellesley, Mass.

Lepidoptera.—Bred specimens of *Actias selene*, hybrids from *luna* et *selene*, *cecropia* et *gloveri*, *cecropia* et *ceanothi*, and other rare moths; cocoons of *angulifera*, *luna* and *P. pithecium;* lists exchanged.—Emily L. Morton, Newburgh, N. Y.

Lepidoptera.—Wanted, cocoons of *luna*, *cecropia*, *promethea*, *gloveri*, *ceanothi*, *regalis*, *imperialis* and others; also pupæ of Sphingidæ, against Lepid. of Eur. and India.—A. Voelschow, Schwerin, Mecklenburg, Germ.

Coleoptera and **Lepidoptera.**—I desire to exchange specimens with collectors in the South and West who wish to extend their collections; correspondence solicited.—F. W. Russell, M.D., Winchendon, Mass.

I am desirous of collecting in any of the Orders in Northwestern Ohio; write me.—N. Sager, Jr., Herring, P. O., Allen Co., Ohio.

Diurnal Lepidoptera.—I will be pleased to correspond with collectors with view to exchanging Lepidoptera of the world. I usually have 2000 or 3000 mounted duplicates on hand, in perfect condition. A. G. Weeks, r., 360 Washington St., Boston.

Lepidoptera.—A few rare Indian Lepidoptera to exchange for rare species from the Northwest.—Levi W. Mengel, Reading, Pa.

Correspondence and exchange of insects desired with young entomologists, especially in the Southern and Western States and Mexico.—Stewart N. Dunning, 43 Niles St., Hartford, Conn.

Coleoptera.—*Aegialites Fuchsii* Horn, Trans. Am. Ent. Soc. xx, p. 143, 1893. I offer this rare and interesting species in exchange for Coleoptera not in my coll. Address C. Fuchs, 212 Kearney St., San Francisco, Cal.

Lepidoptera.—I desire to obtain eggs or larvæ of *Eacles regalis* and *Sphinx modesta;* will exchange for other good material.—Hermann Aich, 43 Murray St., New York.

Lepidoptera.—I have a large number of duplicates which I offer for sale or exchange. Address G. Cleveland, 17 Elm St., Oneonta, N. Y.

Lepidoptera.—Several thousand specimens taken in Utah during past Summer for exchange; *Parnasius, Chionobas, Theclas*, etc.; also good specimens from Illinois; all in papers.—A. J. Snyder, North Evanston, Ill.

Lepidoptera.—Wanted, cocoons of *regalis, imperialis, gloveri, io, cecropia, polyphemus, promethea* and others, as well as pupæ,—against Lepidoptera of all parts of the world.—Bernard Gerhard, 1520 Lafayette Avenue, St. Louis, Mo.

Lepdoptera.—Correspondents wanted on Pacific coast, or Colorado, with a view to exchange in Lepidoptera.—Oliver J. Staley, Marshall, Saline County, Mo.

Lepidoptera.—We wish to obtain, either by purchase or exchange, live larvæ or pupæ of *Ecpantheria scribonia* and imagos of *Erebus odora.*—Field Brothers, Milton, Mass.

Wanted.—Coleoptera and Lepidoptera from all sections. Will exchange works on Entomology, Zoology and Botany, and works relating to the languages of the N. A. Indian. Send for list.—Wm. D. Doan, Box, 377, Coatesville, Pa.

Lepidoptera.—I have for exchange a large number of duplicates of last summer's collecting. Please write for list, Also cocoons of *Cecropia* and *Polyphemus.*—James Tough, 234 S. Water Street, Chicago, Ill.

Lepidoptera.—I have a large number of specimens, taken in the Sierra Nevada Mountains, for exchange.—F. Burns, Verdi, Nevada.

Orthoptera.—Wanted, by exchange or purchase, specimens of the subfamily *Tettiginæ* from all parts of North America; literature also desired. —Dr. Joseph L. Hancock, 255 31st St. Chicago, Ill.

Lepidoptera.—I desire to procure by purchase or in exchange for North American insects of all orders, exotic Lepidoptera of bright colors and in good condition.—Shelley W. Denton, Wellesley, Mass.

Diptera.—N. A. Diptera wanted from choice localities; exchange or purchase. Will name, as far as I can, for privilege of retaining desiderata. Dolichopodidæ especially desired.—J. M. Aldrich, Moscow, Idaho.

Coleoptera.—Many desirable species for exchange.—Chas. Upson Clark, 120 College St., New Haven, Conn.

Tenthredinidæ of all parts of U. S. and Can. in exchange for Hymenoptera of North. Illinois. Send lists; only specimens in good condition wanted.—Wm. A. Nason, Algonquin, Ill.

Coleoptera.—I desire to exchange for native and exotic species.—Frederick Knab, Box 249, Chicopee, Mass.

Lepidoptera.—Want live pupæ and imagos in papers of Papilioninæ and Pierinæ, esp. varieties and Calif. and Mex. forms; rare Rhopalocera and silkmoths from India, China, Africa, Austr. and Eur. in exchange.—John Watson, 177 Moss Lane, East, Manchester, England.

Lepidoptera.—I wish to obtain good, sound cocoons of *Telea polyphemus.*—H. G. White, 508 Sixth Ave., Brooklyn, N. Y.

Lepidoptera.—Pupæ and pupa cases wanted. Shall be glad to buy or make other return if possible. T. A. Chapman, Firbank, Hereford, Eng.

Coleoptera and **Lepidoptera.**—Fine specimens of the large Longicorn *Dorcaschema wildii* to exchange; also fine specimens of the following Lepidoptera: *Pamphila massasoit, zabulon, panoquin, pontiac, fusca, aaronii, cernes, manataaqua*, etc.—Philip Laurent, 1306 Chestnut Street, Philadelphia, Pa.